REMARKS

Careful review and examination of the subject application are noted and appreciated.

SUPPORT FOR THE CLAIM AMENDMENTS

Support for the claim amendments may be found in the specification, for example, on page 11 lines 1-11, page 17 line 19-page 18 line 5, page 20 lines 9-16 and FIGS. 5 and 6, as originally filed. Thus, no new matter has been added.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The rejection of claims 1-25 under 35 U.S.C. §103(a) as being unpatentable over Jeon, US Pub. 2004/0066848, in view of Kato et al., '164 (hereafter Kato), has been obviated in part, is respectfully traversed in part, and should be withdrawn.

Jeon concerns a direct mode motion vector calculation method for B picture (Title). Kato concerns macroblock coding including difference between motion vectors (Title).

Claim 1 provides a method for representing a motion for two blocks, wherein the two blocks use a macroblock adaptive field/frame coding. Despite the assertion in the Office Action, paragraph 0087 of Jeon appears to be silent regarding macroblock adaptive field/frame coding:

> [0087] On the other hand, a frame mode and a field mode are switched at a picture level, so the B picture and list 1

reference picture can be coded into frame mode or field mode. As a result, a macroblock of the B picture and a co-located macroblock of the list 1 reference picture have four types of frame/field-coded combinations.

Jeon appears to discuss B pictures, frame modes and field modes. Jeon appears to be silent regarding two macroblocks having macroblock adaptive field/frame (MBAFF) coding. In contrast, one of ordinary skill in the art would understand the term MBAFF coding to involve coded frames in which some macroblocks may be coded as frame macroblocks and other macroblocks may be coded as field macroblocks. Furthermore, the two macroblocks in an MBAFF coding are a pair of vertically contiguous macroblocks. See paragraphs 3.70 and 3.73 of the ISO/IEC 1496-10:2002 (E) draft recommendation, reproduced as Appendix A. Given the ordinary understanding of MBAFF coding, one of ordinary skill in the art would appear to understand that Jeon and Kato, alone or in combination, do not teach or suggest a method for representing a motion for two blocks, wherein the two blocks use a macroblock adaptive field/frame coding, as presently claimed. Claims 13, 20 and 21 provide language similar to claim 1.

Claim 1 further provides a step of exchanging a particular value of a plurality of values with a memory, each of the values defining which of the two blocks use which of a plurality of motion vectors based upon one of a plurality of prediction types, wherein (1) the prediction types include (i) a first prediction type of the two block using a first reference

picture list, (ii) a second prediction type of the two blocks using a second reference picture list, (iii) a third prediction type of the two blocks using a bidirectional prediction and (iv) a fourth prediction type of the two blocks using an intra prediction. Despite the assertion in the Office Action, paragraph 0023 of Jeon appears to be silent regarding a value defining which of two MBAFF coded macroblocks use which of a plurality of motion vectors:

> [0023] Preferably, the above step may include the step of, if both a macroblock of the B picture and a co-located macroblock of the list 1 reference picture are in a frame mode and a list 0 reference picture for direct mode temporally precedes the list 1 reference picture, calculating the direct mode motion vectors MV_F and MV_B of the B picture as follows:
>
> $MV_F = TD_B \times MV/TD_D$
> $MV_B = (TD_B - TD_D) \times MV/TD_D$
> or
> $Z = TD_B \times 256/TD_D$ $\quad MV_F = (Z \times MV + 128) >> 8$
> $W = Z - 256$ $\quad MV_B = (W \times MV + 128) >> 8$

Nowhere in the above text, or in any other section, does Jeon appear to mention a particular value of a plurality of values, each of the values defining which of the two (MBAFF coded) blocks use which of a plurality of motion vectors based upon one of a plurality of prediction types, as presently claimed. Furthermore, only a single macroblock of a B picture is mentioned in the above paragraph, a second macroblock of the B picture MBAFF coded with the first macroblock is not discussed. Claims 13 and 20 provide language similar to claim 1. As such, the Office is respectfully requested to either (i) clearly identify the two macroblocks, the

particular value, the motion vectors and the four prediction types allegedly similar to the claimed two macroblocks, the claimed particular value, the claimed motion vectors and the four claimed prediction types, respectively or (ii) withdraw the rejections to claims 1, 13 and 20.

Claim 1 further provides a step of representing the motion for the two blocks with a group comprising the particular value and up to all of the motion vectors. Despite the assertion in the Office Action, paragraph 0055 of Jeon appears to be silent regarding a group comprising a particular value (defining which of the two blocks use which of the motion vectors) and up to all of the motion vectors:

> [0055] In accordance with another aspect of the present invention, there is provided a method for calculating direct mode motion vectors of a B (Bi-predictive) picture in a moving picture coding system to extract the direct mode motion vectors of the B picture, comprising the step of assigning a sign to an inter-picture temporal distance value, scaling a motion vector of a co-located block in a list 1 reference picture for direct mode regardless of locations of the list 0 and the list 1 reference pictures for direct mode to derive a list 0 motion vector MV_F and a list 1 motion vector MV_B, and calculating the direct mode motion vectors of the B picture.

The only "value" mentioned above appears to be the inter-picture temporal distance value. However, the inter-picture temporal distance value of Jeon does not appear to define which of the two blocks use which of the motion vectors. Furthermore, no "group" comprising the inter-picture temporal distance value and any of the motion vectors is mentioned. Therefore, Jeon and Kato, alone or in

combination, do not appear to teach or suggest a step of representing the motion for the two blocks with a group comprising the particular value and up to all of the motion vectors, as presently claimed. Claims 13 and 20 provide language similar to claim 1. As such, the Office is respectfully requested to either (i) explain what in Jeon is allegedly similar to the claimed particular value and the claimed group or (ii) withdraw the rejections to claims 1, 13 and 20.

Claim 21 further provides a step for generating a representation for a motion for two (MBAFF coded) blocks. Despite the assertion in the Office Action, paragraph 0055 of Jeon, reproduced above, appears to be silent regarding a representation for a motion for two MBAFF coded blocks, as presently claimed. As such, the Office is respectfully requested to either (i) clearly identify the feature in Jeon allegedly similar to the claimed representation or (ii) withdraw the rejection of claim 21.

Claim 21 further provides that the representation has less than a maximum number of bits capable of representing each possible combination of four motion vectors for the two blocks. Despite the assertion in the Office Action, paragraph 0055 of Jeon, reproduced above, appears to be silent regarding a representation having less than a maximum number of bits capable of representing each possible combination of four motion vectors for the two blocks, as presently claimed. Furthermore, the cited paragraph of

Jeon only mentions two motion vectors for a single macroblock in a B picture, whereas the claim includes four motion vectors and two macroblocks. As such, the Office is respectfully requested to either (i) clearly identify where Jean allegedly teaches a maximum number of bits that are capable of representing each possible combination of four motion vectors for the two macroblocks and where Jeon allegedly teaches that the representation uses less than that maximum number or (ii) withdraw the rejection of claim 21.

Claim 4 provides a step of excluding a second plurality of the motion vectors from the group. In contrast, both Jeon and Kato appear to be silent regarding excluding any motion vectors from a group. Therefore, Jeon and Kato, alone or in combination, do not appear to teach or suggest a step of excluding a second plurality of the motion vectors from the group, as presently claimed. Furthermore, no arguments are presented in the Office Action so *prima facie* obviousness has not been established. As such, claim 4 is fully patentable over the cited references and the rejection should be withdrawn.

Claim 8 provides wherein (i) the motion vectors comprise two motion vectors and (ii) each of the two motion vectors is used for a different one of the two blocks. Despite the assertion in the Office Action, paragraph 0100 of Jeon appears to be silent regarding using each of two motion vectors for a different one of two blocks:

> [0100] where, TD_B represents a temporal distance between a current B frame and a list 0 reference frame, and TD_D represents a temporal distance between a list 1 reference frame and the list 0 reference frame.

Nowhere in the above paragraph, or in any other section, does Jeon appear to mention two MBAFF coded blocks using different motion vectors. Therefore, Jeon and Kato, alone or in combination, do not appear to teach or suggest wherein (i) the motion vectors comprise two motion vectors and (ii) each of the two motion vectors is used for a different one of the two blocks, as presently claimed. Claim 9 provides language similar to claim 8. As such, claims 8 and 9 are fully patentable over the cited references and the rejections should be withdrawn.

Claim 12 provides steps of (i) interpreting the motion vectors in the group based upon the particular value while above a predetermined standard level for a bitstream and (ii) using the motion vectors in the group independently of the particular value while below the predetermined standard level for the bitstream. In contrast, both Jeon and Kato appear to be silent regarding the use of motion vectors based upon standard levels of a bitstream. Therefore, Jeon and Kato, alone or in combination, do not appear to teach or suggest steps of (i) interpreting the motion vectors in the group based upon the particular value while above a predetermined standard level for a bitstream and (ii) using the motion vectors in the group independently of the particular value while below the predetermined standard level for the bitstream, as

presently claimed. Furthermore, no arguments are made in the Office Action against claim 12 so *prima facie* obviousness has not been established and the rejection should be withdrawn.

Claim 23 provides that the representation is configured to accommodate (i) a first number of possible vectors that could be expressed by a first of the motion vectors corresponding to a first block of the two blocks, (ii) a second number of possible vectors that could be expressed by a second of the motion vectors corresponding to the first block, (iii) a third number of possible vectors that could be expressed by a third of the motion vectors corresponding to a second block of the two blocks and (iv) a fourth number of possible vectors that could be expressed by a fourth of the motion vectors corresponding to the second block. Despite the assertion in the Office Action, paragraphs 0005 and 0006 of Jeon appear to be silent regarding accommodations of four numbers of possible vectors corresponding to the four motion vectors of the two blocks:

> [0005] On the other hand, a B picture proposed in a next-generation moving picture compression technique such as H.264 or MPEG-4 part 10 is characterized in that the B picture is allowed to be used as a reference picture because it can be stored in a reference picture buffer. This B picture is further characterized in that it has five types of predictive modes such as list 0 mode, list 1 mode, bi-predictive mode, direct mode and intra mode.
>
> [0006] The list 0 mode is similar to the conventional forward mode, and motion information such as a reference picture index and motion vector difference are indicated respectively by ref_idx__10 and mvd__10. The list 1 mode is also similar to the conventional backward mode, and motion information

> such as a reference picture index and motion vector difference are indicated respectively by ref_idx__11 and mvd__11. The bi-predictive mode has two reference pictures, both of which may be located temporally before or after the B picture, or which may be located temporally before and after the B picture, respectively. In this case, two reference picture indexes and two motion vector differences are indicated respectively by ref_idx__10, ref_idx__11, mvd__10, and mvd__11, and each reference pictures has picture order count (POC) data which is temporal location information.

Nowhere in the above paragraphs, or in any other sections, does Jeon appear to teach or suggest that the representation is configured to accommodate (i) a first number of possible vectors that could be expressed by a first of the motion vectors corresponding to a first block of the two blocks, (ii) a second number of possible vectors that could be expressed by a second of the motion vectors corresponding to the first block, (iii) a third number of possible vectors that could be expressed by a third of the motion vectors corresponding to a second block of the two blocks and (iv) a fourth number of possible vectors that could be expressed by a fourth of the motion vectors corresponding to the second block, as presently claimed. As such, the Office is respectfully requested to either (i) clearly identify one-to-one the elements of Jeon allegedly similar to the claimed elements or (ii) withdraw the rejection.

Claim 24 provides wherein the presentation is less than a base 2 logarithm of a product of the first number, the second number, the third number and the fourth number rounded up to a

nearest integer. In contrast, both Jeon and Kato appear to be silent regarding a base 2 logarithm of a product of four numbers. Therefore, Jeon and Kato, alone or in combination, do not appear to teach or suggest wherein the presentation is less than a base 2 logarithm of a product of the first number, the second number, the third number and the fourth number rounded up to a nearest integer, as presently claimed. Furthermore, no arguments are made in the Office Action against claim 24 so *prima facie* obviousness has not been established and the rejection should be withdrawn.

Claim 25 provides wherein the representation is capable of representing up to two motion vectors corresponding to each of the two blocks, each of the two motion vectors corresponding to each of the two blocks can take on at least 67,108,864 unique values, and the representation uses fewer than 104 bits. In contrast, both Jeon and Kato appear to be silent regarding the claimed number of unique values and the claimed number of bits. Therefore, Jeon and Kato, alone of in combination, do not appear to teach or suggest wherein the representation is capable of representing up to two motion vectors corresponding to each of the two blocks, each of the two motion vectors corresponding to each of the two blocks can take on at least 67,108,864 unique values, and the representation uses fewer than 104 bits, as presently claimed. Furthermore, no arguments are made in the Office Action against

claim 25. Therefore, *prima facie* obviousness has not been established and the rejection should be withdrawn.

Claims 2-12, 14-19, and 22-25 depend from claims 1, 13 and 21, which are now believed to be allowable. As such, the above dependent claims are fully patentable over the cited references and the rejections should be withdrawn.

COMPLETENESS OF THE OFFICE ACTION

Aside from a notice of allowance, Applicant's representative respectfully requests any further action on the merits be presented as a non-final action. No sustainable arguments were presented for claims 4, 24 and 25 as required by 37 CFR §1.104(b) and MPEP §706.07. As such, the current Office Action is incomplete and should be withdrawn.

Accordingly, the present application is in condition for allowance. Early and favorable action by the Examiner is respectfully solicited.

The Examiner is respectfully invited to call the Applicants' representative between the hours of 9 a.m. and 5 p.m. ET at 586-498-0670 should it be deemed beneficial to further advance prosecution of the application.

If any additional fees are due, please charge Deposit Account No. 12-2252.

Respectfully submitted,

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Dated: June 26, 2007

c/o Henry Groth
LSI Corporation

Docket No.: 03-0578 / 1496.00309

Joint Video Team (JVT) of ISO/IEC MPEG & ITU-T VCEG
(ISO/IEC JTC1/SC29/WG11 and ITU-T SG16 Q.6)
8th Meeting: Geneva, Switzerland, 23-27 May, 2003

Document: JVT-G050r1
Filename: JVT-G050r1.doc

Title:	**Draft ITU-T Recommendation and Final Draft International Standard of Joint Video Specification (ITU-T Rec. H.264 | ISO/IEC 14496-10 AVC)**
Status:	Approved Output Document of JVT
Purpose:	Text

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Source: Editor

[Ed. Notes:

Should double-check font formats in changes.

Some "[Ed. Note"'s appear within this text.

Contains changes for JVT-H010, JVT-H011, JVT-H020, JVT-H025, and JVT-H030.

Also plan to change "if .. if .. if .. otherwise" convention to "if .. otherwise if .. otherwise if .. otherwise per JVT-H010 item 2.]

Title page to be provided by ITU-T | ISO/IEC

DRAFT INTERNATIONAL STANDARD
DRAFT ISO/IEC 14496-10 : 2002 (E)
DRAFT ITU-T Rec. H.264 (2002 E)
DRAFT ITU-T RECOMMENDATION

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Appendix A

~~3.58~~3.59 **inter prediction**: A *prediction* derived from decoded samples of *reference pictures* other than the current *decoded picture*.

~~3.59~~3.60 **intra coding**: Coding of a *block*, *macroblock*, *slice*, or *picture* that uses *intra prediction*.

~~3.60~~3.61 **intra prediction**: A *prediction* derived from the decoded samples of the same *decoded slice*.

~~3.61~~3.62 **intra slice**: See I slice.

~~3.62~~3.63 **inverse transform**: A part of the *decoding process* by which a set of *transform coefficients* are converted into spatial-domain values, or by which a set of *transform coefficients* are converted into *DC transform coefficients*.

~~3.63~~3.64 **layer**: One of a set of syntactical structures in a non-branching hierarchical relationship. Higher layers contain lower layers. The coding layers are the *coded video sequence*, *picture*, *slice*, and *macroblock* layers.

~~3.64~~3.65 **level**: A defined set of constraints on the values that may be taken by the *syntax elements* and variables of this Recommendation | International Standard. The same set of levels is defined for all *profiles*, with most aspects of the definition of each level being in common across different *profiles*. Individual implementations may, within specified constraints, support a different level for each supported *profile*. In a different context, *level* is the value of a *transform coefficient* prior to *scaling*.

~~3.65~~3.66 **list 0 (list 1) motion vector**: A *motion vector* associated with a *reference index* pointing into *reference picture list 0* (*list 1*).

~~3.66~~3.67 **list 0 (list 1) prediction**: *Inter prediction* of the content of a *slice* using a *reference index* pointing into *reference picture list 0* (*list 1*).

~~3.67~~3.68 **luma**: An adjective specifying that a sample array or single sample is representing the monochrome signal related to the primary colours. The symbol used for luma is Y.

NOTE – The term luma is used rather than the term luminance in order to avoid the implication of the use of linear light transfer characteristics that is often associated with the term luminance.

~~3.68~~3.69 **macroblock**: A 16x16 *block* of *luma* samples and two corresponding *blocks* of *chroma* samples. The division of a *slice* or a *macroblock pair* into macroblocks is a *partitioning*.

~~3.69~~3.70 **macroblock-adaptive frame/field decoding**: A *decoding process* for *coded frames* in which some *macroblocks* may be decoded as *frame macroblocks* and others may be decoded as *field macroblocks*.

~~3.70~~3.71 **macroblock address**: When *macroblock-adaptive frame/field decoding* is not in use, a macroblock address is the index of a macroblock in a *macroblock raster scan* of the *picture* starting with zero for the top-left *macroblock* in a *picture*. When *macroblock-adaptive frame/field decoding* is in use, the macroblock address of the *top macroblock* of a *macroblock pair* is two times the index of the *macroblock pair* in a *macroblock pair raster scan* of the *picture*, and the macroblock address of the *bottom macroblock* of a *macroblock pair* is the macroblock address of the corresponding *top macroblock* plus 1. The macroblock address of the *top macroblock* of each *macroblock pair* is an even number and the macroblock address of the *bottom macroblock* of each *macroblock pair* is an odd number.

~~3.71~~3.72 **macroblock location**: The two-dimensional coordinates of a *macroblock* in a *picture* denoted by (x, y). For the top left *macroblock* of the *picture* (x, y) is equal to (0, 0). x is incremented by 1 for each *macroblock* column from left to right. When *macroblock-adaptive frame/field decoding* is not in use, y is incremented by 1 for each *macroblock* row from top to bottom. When *macroblock-adaptive frame/field decoding* is in use, y is incremented by 2 for each *macroblock pair* row from top to bottom, and is incremented by an additional 1 when a macroblock is a *bottom macroblock*.

~~3.72~~3.73 **macroblock pair**: A pair of vertically contiguous *macroblocks* in a *frame* that is coupled for use in *macroblock-adaptive frame/field decoding* processing. The division of a *slice* into macroblock pairs is a *partitioning*.

~~3.73~~3.74 **macroblock partition**: A *block* of *luma* samples and two corresponding *blocks* of *chroma* samples resulting from a *partitioning* of a *macroblock* for *inter prediction*.

~~3.74~~3.75 **macroblock to slice group map**: A means of mapping *macroblocks* of a *picture* into *slice groups*. The macroblock to slice group map consists of a list of numbers, one for each coded *macroblock*, specifying the *slice group* to which each coded *macroblock* belongs.

~~3.75~~3.76 **map unit to slice group map**: A means of mapping *slice group map units* of a *picture* into *slice groups*. The map unit to slice group map consists of a list of numbers, one for each *slice group map unit*, specifying the *slice group* to which each coded *slice group map unit* belongs.

~~3.76~~3.77 **memory management control operation**: Seven operations that control *reference picture marking*.